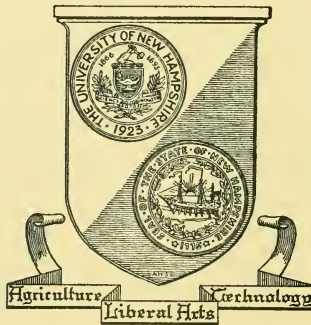




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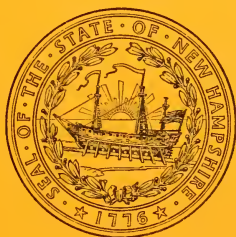
SEPTEMBER, 1949

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION

Department of Agricultural and Biological Chemistry

Inspection of Commercial Fertilizers

Made for the
STATE DEPARTMENT OF AGRICULTURE



H. A. DAVIS, S. H. ROSEMAN and T. O. SMITH

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Perley I. Fitts, Commissioner of Agriculture. Mr. George H. Laramie, Fertilizer Control Supervisor, and Mr. Vincent P. Peterson, Inspector, collected samples of 91 brands of mixed fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1949. The general character of the brands sampled is shown by the following classification:

Complete fertilizer	57
Phosphoric acid and potash	9
Superphosphate	8
Nitrate of soda	1
Ammonium nitrate	1
Muriate of potash	3
Ground bone	4
Milorganite	1
Natural manures	6
Urea	1

THE FERTILIZER LAW

The purchaser of fertilizer should familiarize himself with the full text of the fertilizer law. He should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in compliance with the law. The law governing these matters follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package; the name, brand or trademark under which the fertilizer is sold; the name and address of the manufacturer or importer; the location of the factory; and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water-soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

Copies of the full text of the law may be obtained from the Fertilizer Control Supervisor, State House, Concord, N. H. Inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which doubtless would soon appear on the market if the sale of fertilizer was not under state regulation. The value of a fertilizer depends mainly upon its content of available plant food, particularly nitrogen, phosphoric acid, and potash. The presence

of these constituents can be determined only by a chemical analysis. To insure that they are being furnished by manufacturers in the guaranteed amounts, it is considered necessary that each brand of fertilizer offered for sale be officially inspected and analyzed each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law but will at the same time insure him the protection of the law. If the buyer fails to assure himself that the legal requirements have been met, he accepts the fertilizer at his own risk.

USE OF COMMERCIAL FERTILIZERS

It is not within the scope of this bulletin to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire.

- Sta. Cir. 47 Fertilizer Experiments with Sweet Clover. 12 pp.
- Sta. Cir. 50 Fertilizer Experiments with Hay Lands in the Connecticut Valley. 15 pp.
- Sta. Cir. 58 Fertilizer Needs of Alfalfa on New Hampshire Soils. 12 pp.
- Sta. Cir. 59 Effect of Soil Moisture and Fertilizer Placement on Vitality of the Potato Seed Piece. 11 pp.
- Sta. Cir. 61 Fertility Needs of Dairy Farm Crops in the Connecticut Valley. 12 pp.
- Sta. Cir. 63 Fertilizers for Sweet Corn. 8 pp.
- Sta. Cir. 74 The Response of Clover and Total Forage to Top-Dressing Fertilizers. 12 pp.
- Sta. Bull. 306 Experiments with Grass Hay. 24 pp.
- Sta. Bull. 320 Pasture Top-Dressing in New Hampshire. 24 pp.
- Sta. Bull. 324 Experiment with Potatoes. 38 pp.
- Sta. Bull. 362 Purchasing Fertilizers in New Hampshire. 31 pp.
- Ext. Cir. 99 Asparagus Culture. 4 pp.
- Ext. Cir. 173 Grape Growing in New Hampshire. 11 pp.
- Ext. Cir. 210 Purchasing Lime and Fertilizer. 12 pp.
- Ext. Cir. 212 Cabbage. 4 pp.
- Ext. Cir. 260 Tomatoes for Good Health. 8 pp.
- Ext. Cir. 266 Root Crops. 20 pp.
- Ext. Cir. 273 The Home Vegetable Garden. 20 pp.
- Ext. Cir. 275 Culture of Low-Bush Blueberries. 16 pp.
- Ext. Cir. 279 Strawberry Culture. 4 pp.
- Ext. Cir. 287 Forage Production and Grain Saving. 8 pp.
- Ext. Cir. 289 Cane Fruit Culture. 8 pp.
- Ext. Bull. 45 Potato Growing in New Hampshire. 32 pp.
- Ext. Bull. 65 Home Fruit Growing in New Hampshire. 16 pp.

While the word fertilizer does not appear in all the above titles, no publication is included which does not discuss the use of fertilizer.

CONFORMITY TO GUARANTEE

The chemical analyses were made by the methods of the Association of Official Agricultural Chemists.

Number of brands analyzed	91
Equalling or exceeding all guarantees	47
Deficient in nitrogen only	14
Deficient in available phosphoric acid only	9
Deficient in potash only	10
Deficient in nitrogen and phosphoric acid	5
Deficient in nitrogen and potash	5
Deficient in phosphoric acid and potash	1

Six brands were guaranteed to contain magnesium oxide. None failed to meet the guarantee. In general, the overrun in plant food guarantees exceeds the deficiencies when all brands of a manufacturer are included.

Fertilizers are largely mixtures of highly purified chemicals. Segregation of these materials in the bag may be expected. To obtain a truly representative sample of a fertilizer mixture requires careful work. The chemist can accurately determine the nitrogen, phosphoric acid and potash content of the sample sent to the laboratory. If this sample does not correctly represent the larger lot, the analytical work is of no use. The obligation of the fertilizer control program is to see that the manufacturer is supplying the guaranteed amount of plant food to the consumer. For this reason the sample must be drawn and analyzed very carefully so that injustice will not be done to either the consumer or manufacturer.

In the tabulation of the analyses in the following pages deficiencies of one-half per cent or more are shown in red type. The names of the manufacturers are arranged alphabetically. The brand names are listed alphabetically, or numerically by formula, under the manufacturer.

	Nitrogen		Phosphoric Acid		Potash		Magnesium Oxide
	Total		Available				
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	
American Agricultural Chemical Co. North Weymouth, Massachusetts							
Agrico for Corn 3-12-6	3.00	3.19	.....	12.00	11.66	6.00	6.22
Agrico for Gardens 5-10-5	5.00	4.88	.....	10.00	10.25	5.00	5.10
Agrico for Lawns, Trees, Shrubs	6.00	5.83	.....	10.00	10.39	4.00	3.84
Agrico for New England 5-8-7	5.00	5.01	.....	8.00	7.67	7.00	7.38
Agrico for Potatoes 5-10-10	5.00	4.81	.....	10.00	11.21	10.00	8.33
Agrico for Seeding Down 3-12-12	3.00	2.82	.....	12.00	11.79	12.00	12.17
Agrico for Top Dressing 7-7-7	7.00	6.94	.....	7.00	7.30	7.00	7.22
Agrico Phosphate and Potash 0-14-14 .....	.....	.....	.....	14.00	14.02	14.00	13.31
18% Normal Superphosphate .....	.....	.....	.....	18.00	18.66	.....	.....
Apothecaries Hall Co. Waterbury, Connecticut							
Bone Meal	2.25	2.89	22.00	23.18	.....	.....	.....
Liberty Brand 4-12-4	4.00	4.36	.....	.....	11.74	4.00	5.34
Liberty Brand 5-10-10	5.00	5.28	.....	.....	10.25	10.00	9.70
Liberty Brand 5-10-10-2	5.00	5.16	.....	.....	10.57	10.00	11.83
Liberty Brand High Grade Market Gardener 5-8-7	5.00	5.15	.....	.....	8.33	7.00	7.69
Liberty Brand 60% Muriate of Potash .....	.....	.....	.....	.....	.....	60.00	60.39
Liberty Brand Special for Fruit and Grass 7-7-7	7.00	7.22	.....	.....	7.93	7.00	7.36
Liberty Brand 20% Superphosphate .....	.....	.....	.....	.....	20.36	.....	.....
Armour Fertilizer Works Carteret, New Jersey							
Armour's Big Crop Fertilizer 0-14-14 .....	.....	.....	.....	14.00	13.58	14.00	15.34
Armour's Big Crop Fertilizer 5-8-7	5.00	5.02	.....	8.00	8.93	7.00	6.72
Armour's Big Crop Fertilizer 5-10-10	5.00	4.82	.....	10.00	10.15	10.00	9.09

	Nitrogen		Phosphoric Acid		Potash	Magnesium Oxide
			Total	Available		
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Armour's Big Crop Fertilizer 7-7-7						
Armour's Big Crop Superphosphate 20%	7.00	7.01	.....	7.00	7.00	6.77
Armour's Bone Meal	2.47	2.47	23.00	20.00	.....	.....
Armour's Pulverized Sheep Manure	1.50	1.64	1.00	1.24	2.00	2.01
Armour's Velvetgreen Plant Food 5-10-5	5.00	5.26	.....	10.00	5.00	5.36
Atkins & Durbrow, Inc. New York, N. Y.						
Driconure	2.00	2.68	1.00	1.93	1.00	2.34
Chilean Nitrate Sales Corp. New York, N. Y.						
Chilean Nitrate of Soda Champion Brand	16.00	16.17	.....	.....	.....	.....
Consolidated Rendering Co. Boston, Massachusetts						
Corenco 0-14-14 .....	.....	.....	.....	14.00	14.00	13.17
Corenco 5-8-7 Potato and General Crop	5.00	5.28	.....	8.00	7.00	7.07
Corenco Brand Sheep Manure	1.25	1.29	1.00	1.27	2.00	2.69
Corenco Complete Fruit and Top Dressing Fertilizer 7-7-7	7.00	7.03	.....	7.00	7.00	7.52
Corenco Ground Bone	2.00	1.94	23.00	25.40	.....	.....
Corenco Ladino Special 4-12-16	4.00	4.11	.....	12.00	16.00	15.69
Corenco Landscape Fertilizer	8.00	7.75	.....	6.00	4.00	4.29
Corenco Peerless Potato 5-10-10	5.00	5.05	.....	10.00	10.00	10.40
Corenco 20% Superphosphate .....	.....	.....	.....	20.00	20.32	.....
Merrimack Brand 5-8-7	5.00	5.06	.....	8.00	7.00	8.41
Merrimack Brand 5-10-10	5.00	4.87	.....	10.00	10.08	10.24
Merrimack Brand 7-7-7	7.00	7.01	.....	7.00	7.00	7.44
Spurz-On	3.50	3.33	3.50	3.70	1.50	1.84

	Nitrogen		Phosphoric Acid		Potash		Magnesium Oxide
	Total		Available		Found		
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	
Davison Chemical Corp.							
Baltimore, Maryland							
Davco Granulated 0-14-7	.....	.....	.....	14.00	14.07	7.00	7.05
Davco 0-14-14	.....	.....	.....	14.00	14.30	14.00	15.22
Davco Granulated 4-12-4	4.00	3.81	.....	12.00	11.71	4.00	4.03
Davco Granulated 5-8-7	5.00	4.89	.....	8.00	8.40	7.00	7.52
Davco Granulated 5-10-5	5.00	4.30	.....	10.00	10.23	5.00	3.89
Davco Granulated 5-10-10	5.00	5.30	.....	10.00	10.29	10.00	10.48
Davco Granulated 7-7-7	7.00	6.69	.....	7.00	7.71	7.00	7.21
Davco Granulated 8-16-16	8.00	7.33	.....	16.00	16.01	16.00	16.45
Davco Granulated 20% Superphosphate	.....	.....	.....	20.00	20.98	.....	.....
E. I. duPont de Nemours Co.							
Wilmington, Delaware							
duPont Nu Green Fertilizer Compound	43.00	44.55	.....	.....	.....	.....	.....
Eastern States Farmers' Exchange, Inc.							
West Springfield, Massachusetts							
Eastern States 0-19-19 with Borax	.....	.....	.....	19.00	20.81	19.00	16.85
Eastern States 0-20-20	.....	.....	.....	20.00	20.27	20.00	20.08
Eastern States 5-10-10	5.00	5.18	.....	10.00	10.25	10.00	10.43
Eastern States 5-15-10	5.00	4.76	.....	15.00	16.21	10.00	10.09
Eastern States 5-15-15	5.00	5.16	.....	15.00	14.51	15.00	16.23
Eastern States 8-16-16	8.00	7.16	.....	16.00	19.45	16.00	13.66
Eastern States 8-16-16	8.00	7.86	.....	16.00	16.29	16.00	16.84
Eastern States 10-10-10-1	10.00	10.06	.....	10.00	10.02	10.00	9.66
Eastern States Garden 5-10-5	5.00	5.01	.....	10.00	10.37	5.00	5.95
Eastern States Muriate of Potash	.....	.....	.....	.....	60.00	60.00	60.66
Eastern States Superphosphate 20%	.....	.....	.....	20.00	20.78	.....	.....
							2.13

	Nitrogen		Phosphoric Acid		Potash		Magnesium Oxide
	Total	Available	Total	Available	Total	Available	
Potash Company of America Carlsbad, New Mexico							
Muriate of Potash	.....	.....	.....	.....	60.00	61.53	.....
Rogers & Hubbard Co. Portland, Connecticut							
Gro-Fast Bone Meal	2.00	2.66	23.00	27.67	.....	.....	.....
Gro-Fast Plant Food	5.00	5.38	.....	.....	5.00	5.79	.....
Gro-Fast Sheep Manure	1.25	1.70	1.00	1.36	2.00	3.52	.....
Hubbard Double Strength Fertilizer 8-16-16	8.00	8.01	.....	.....	16.00	15.25	.....
Hubbard General Crop Fertilizer	5.00	5.22	.....	.....	10.00	10.17	.....
Hubbard High Potash 5-10-10-2	5.00	5.46	.....	.....	10.00	10.28	2.00
Hubbard Top Dressing	7.00	7.07	.....	.....	7.00	7.53	.....
Hubbard Vegetable Fertilizer 5-8-7	5.00	5.29	.....	.....	7.00	7.50	.....
Red H 5-8-7	5.00	5.10	.....	.....	7.00	7.46	.....
Red H 20% Superphosphate	.....	.....	.....	.....	.....	.....	.....
The Sewerage Commission Milwaukee, Wisconsin							
Milorganite	6.00	5.94	2.00	3.10	.....	.....	.....
Swift & Co. Baltimore, Maryland							
Vigoro	4.00	4.01	.....	.....	4.00	4.24	.....

